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LIBRARY SYSTEMS ANALYSIS.

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STEPS THAT THE LIBRARY CAN TAKE IN PREPARING FOR A CHANGE TO AN AUTOMATED SYSTEM WERE INVESTIGATED. THE METHOD DESCRIBED WAS BASED ON AN ANALYSIS OF CLERICAL AND OFFICE WORK CALLED INTEGRATED PROCEDURES OF CONTROL (IPC). THE APPLICATION OF LIBRARY SYSTEMS ANALYSIS (LISA) TO THE LEHIGH UNIVERSITY LIBRARY IS DESCRIBED. THIS PROCESS INVOLVED (1) DEVELOPING A GENERALIZED REPRESENTATION OF THE LIBRARY, (2) DEVELOPING AN EFFECTIVE MODEL OF THE LIBRARY, (3) DEVISING A STANDARD METHOD FOR COLLECTING DATA, (4) ASSIGNING CLASSIFICATIONS AND CODES FOR THE COLLECTED DATA, (5) REDUCING THE DATA TO PUNCHED CARDS, AND (6) DETERMINING WAYS OF EVALUATING THE PUNCHED CARD MODEL. THE INVESTIGATORS CONCLUDED THAT LISA SHOULD BE APPLICABLE TO MOST MEDIUM-SIZED ACADEMIC AND RESEARCH LIBRARIES. (WB)

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CENTER FOR THE INFORMATION SCIENCES
LEHIGH UNIVERSITY BETHLEHEM, PENNSYLVANIA

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Report Number 3

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Robert S. Taylor
and
Caroline E. Hieber

This project supported by the Office of Education, Department of Health, Education and Welfare, Washington, D.C. under Project No. S-235.

September 8, 1965

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CENTER FOR THE INFORMATION SCIENCES

Lehigh University
Bethlehem, Pa.

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Robert S. Taylor, Director,

and

Caroline E. Hieber, Research Assistant,

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Preface

The Library Systems Analysis Manual developed in this project provides a frame of reference for librarians in analyzing their systems for eventual automation. The automation of library processes will allow the library to expand its participation in the educational functions of the institution in a number of ways. First, it will release valuable professional time from routine operations. Secondly, in the process of defining and writing computer programs for routines, the library profession will be forced to explore the intricacies and redundancies of library systems as they have never been examined before. Thirdly, automation will in the next decade open up entirely new areas of interaction between student and recorded knowledge.

The normal research library can take steps to prepare for this change. It is necessary, however, that it first know itself. The manual described in this report provides an analytic approach to this problem.

The two decks of punched cards described in this manual - one concerning library processes and the other concerning the user and his requirements - should provide an empirically-derived model of a library. The total system or its component parts may be studied from any one or more of many different angles, and the information derived measured against whatever standards the library regards as ideal.

The data collected at Lehigh may not be the data deemed important at other institutions, but the methods of collecting and handling these data should be applicable to most medium-sized academic and research libraries.

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PART I

SYSTEMS ANALYSIS OF LIBRARY PROCESSES

I. Introduction

The advantages of automating library processes and thus releasing valuable professional time from routine operations have been rather thoroughly discussed.[1] There is however little in the literature about the important first step in a changeover to automation - that of analyzing an existing system. Most libraries will not make a quantum jump to automation, and a systems study is necessary first to determine whether or not automation is advisable; and second, if a decision is made in favor of automation, which subsystems best lend themselves to it.

Even if automation is not being considered for a library, environmental and budgetary pressures for increased service with no increase in staff provide a strong motive for a systems study to point out ways of making more effective use of staff time.

Systems studies have traditionally relied on such techniques as flow charts, written procedures manuals, time and motion studies, and time standards. Most of these methods were developed for use in industrial shops and are of limited practicality in other situations. Flow charts, for example, are effective for overall analyses, but a detailed flow chart of all library processes will cover an area of several hundred square feet and will be intelligible, if at all, only to its creator. Procedures manuals have their uses, but not as tools for work measurement. Motion studies and time standards are impractical because they do not account for the irregularities in volumes that are characteristic of many library operations.

Some of the areas of interest in analyzing library systems are the following:

"Routine" operations, such as circulation control;

"Intellectual" operations requiring judgment, such as acquisitions and reference work;

The communication flow within the library staff and between the staff and its public;

The degree of success of a library in answering the needs of its users, which involves meaningful classifications of library inquiries and the ways in which patrons use libraries;

A qualitative analysis of the levels of decision-making in a library;

Miscellaneous areas, such as quality of shelving, integrity of circulation control, and amount and type of "dirt" in the files.

These are generally related to functional data and their communication, both of which are stressed by the method of systems analysis described in this manual.

II. Method - General

The method, named LISA (LIbrary Systems Analysis), is based on an approach to clerical and office work called Integrated Procedures Control (IPC).[2] IPC was developed by Professor Wallace J. Richardson of Lehigh University and Robert E. Heiland, formerly of Lehigh. Because of the complexity of office work, the greatest problem in analyzing it is that of reconciling and evaluating a wide variety of activities for which there is no standard means of analysis. The creators

of IPC believe that concepts used in industrial engineering can be applied in an office, with the forms passing through it as the vehicle of analysis. The forms themselves are considered comparable to raw materials in a factory. The procedures involving the forms are analogous to work in process, and completed records to finished goods. Since its development in 1956, IPC has been used successfully in a variety of industrial and governmental organizations, including the U. S. Army Ordnance Management Engineering Training Program.[3] While there is obviously not a one-to-one correspondence between office and library activities, there are enough similarities to make an adaptation of IPC applicable in libraries.

LISA, as derived from IPC, uses two techniques. The first is that the medium of data collection, as in IPC, is a form. Library forms, as we conceive of them, are of three types:

1. Printed or typed forms used for internal records and processing, such as catalog cards, overdue notices, book cards, purchase orders, etc.
2. Books and other types of graphic materials, including microforms, maps, drawings, etc., which comprise the stored packages in a library. This category may be enlarged to include such non-graphic materials as recordings, tapes, motion pictures, etc.
3. Inquiries, both verbal and written, received by a library.

Secondly, the collected data are coded and placed on punched cards. The deck of punched cards can then be manipulated to

organize the data by function, by process, or in other ways.

Among the advantages of LISA are the following:

1. All data are reduced to punched cards, and can thereafter be presented in any desired breakdown.
2. The cost and difficulty of the analysis are comparable to the cost and difficulty of flow chart analysis and have the same degree of detail. After the data are collected and coded, however, the punched cards are more versatile and much easier to work with than flow charts.
3. The deck of punched cards can serve as a reference file of library procedures, and can be updated simply by substituting a few new cards.
4. The process of analysis may be stopped at the end of any of its steps, if time or circumstance preclude its being done all at once.

This manual describes the LISA system as it was applied in the Lehigh University Library. This library contains 430,000 volumes. It serves a faculty of 300 and a student body of 4,200, and circulates about 150,000 volumes annually. At the time of the analysis no library operations were automated, although automation of circulation is scheduled for Fall, 1965. LISA was also tested briefly in the libraries of Florida Atlantic University, Pennsylvania State University, and Rutgers State University.

III. Idealized Library System

The first step in the analysis is the development of a generalized representation of the library. The system outline

that follows shows five functions which, we feel, are typical of most libraries. Each of these is composed of several subsystems. The number of subsystems will depend, of course, on the complexity of the specific library being studied. Coding for each of the major activities of the library is derived from an outline of these five functions.

A. Environmental

This encompasses the decision-making and policy-making responses to the intellectual and administrative environment both within and without the institution. The environment within the institution is created by the activities in the other four categories listed below. The climate outside the institution is beyond the scope of a systems analysis, except as it is reflected by users of the library (functions 4 and 5 discussed below). For these reasons we have given major attention to the other systems categories, although the classification "Environmental" has been assigned to some operations such as payroll and statistical reporting.

B. Acquisition of Materials

Acquisition here pertains to all activities which bring materials, supplies, and equipment into the library, and control the accounting and budgetary procedures.

C. Organizing Materials

This process is accomplished by a variety of traditional library operations - cataloging, classification, marking, shelving, filing, etc.

D. Formalizing the User's Need

"Need" may be a specific book or piece of data, extensive

information on a topic, browsing for enjoyment, or a quiet place to read or study. The user may formalize and fulfill his own needs or he may seek advice, instruction, and direction from the library staff.

E. Matching Need with Facilities and Material

The preceding category attempts to define the user's need; this one tries to match it to the facilities and material available.

The output from each category of systems becomes the input for the next, and the result of matching user needs with facilities provides feedback to the first, environmental, category, so that the five categories are, in a sense, circular.

IV. Form Cards

A. Data Collection

A copy of each form originated or having its first internal use in the library is collected. The forms may be gathered by the supervisor of each department, or by the analyst. At Lehigh, because the project was a pilot study and not a Library-sponsored analysis, supervisory personnel were not asked to do any more than necessary for completion of the project, and data were collected by the analyst. Rightly or wrongly, a priori decisions were made that some forms were not important, based on statements by library personnel that the forms were practically never used. These unimportant forms were not considered further in the analysis.

From interviews with staff, the analyst then fills out a Form Card for each different significant form and copy. As

was pointed out earlier, books and other graphic materials are considered forms, as well as items such as catalog cards and purchase orders. At Lehigh the form cards were 8½" x 11" sheets, so that the sheets could be conveniently placed in notebooks. As the analysis progressed, the notebooks became so many and so full that we recommend the use of 5" x 8" file cards such as the one shown in Figure 1. The recommended form card contains ten items of information described below. The coding system is described in Section B.

1. Form Number

This is a six-digit number. The number of the form described in Figure 1 is 352031.

2. Copy Number

In the case of a multiple-part form, the copy number of the form being considered is written in this space. The illustration has a "6" here, because the form is the sixth copy of the slip.

3. Name of Form

It is best to use the terminology of the library employees here. The form described in Figure 1 is an order slip, called, for its six parts, a "Sextet Slip."

4. Physical Size

When the form is of a standard size, such as 3" x 5", 8½" x 11", etc., this is indicated.

5. Physical Characteristics

This is used, where relevant, to describe the physical composition of the form.

FORM CARD			
FORM NO. (1)	COPY NO. (7)	1	352031
352031	6	7	6
NAME OF FORM (8)		8	SEXTET SLIP
Septet slip			
PHYSICAL SIZE (24)			
3 X 5			
PHYSICAL CHARACTERISTICS (26)			
Paper form - carbon copy			
PRIMARY FUNCTION			
Temporary main entry in public catalog			
SECONDARY FUNCTION(S) (29)		24	01
Used for "new books received" file when temporary cataloging done		26	120
POINT OF ORIGIN (30)		29	3
Cataloger		30	52200
POINT OF DISPOSAL (35)		35	2200
Catalog dept.		39	03
AVERAGE VOLUME PER MONTH (39)			
$\frac{4000 \text{ per year}}{12} = 333$			

Figure 1. Sample Form Card

6. Primary Function

Here is written the main purpose for which the form is used. Copy 6 of the Sextet Slip is used as a temporary entry in the public catalog, pending arrival and filing of Library of Congress cards.

7. Secondary Function

Some forms serve more than one purpose, and this is indicated here. The Lehigh University Library has a "New Books Received" file. If a book undergoes temporary cataloging copy 6 of its Sextet Slip is used for this file.

8. Point of Origin

Here are shown the person who originates the form and the department in which it is originated, if this is not implied by the title of the person. The Sextet Slips are originated by a cataloger.

9. Point of Disposal

The name of the department in which the form is destroyed or more or less permanently filed or stored is entered here. Copy 6 in the example is destroyed in the Catalog Department.

10. Average Volume per Month

This figure can be obtained or estimated from statistical records. If the volume occurs in peaks, for example at the beginning or end of a fiscal year or a semester, it may be desirable to indicate this, as well as the average volume.

B. Coding

After the data have been collected the form cards are coded by the analyst along the right-hand vertical margin (see Figure 1). The numbers after the data headings on the card are correlated with those on the edge for convenience in coding. Each number represents the card column number at the beginning of a field on the punched card. As can be seen from the illustration, only the first 40 columns of the punched card are used for describing the form. The punched card for each form is then used as a master card for punched cards denoting an activity performed on, or with, that form (see Part V below). Data in the first 40 columns are reproduced in the first 40 columns of the activity cards, leaving columns 41 to 80 to describe the activity.

There is nothing sacred about the number 40. If more than 40 columns are needed to describe the form (e.g., a form number longer than six digits is required), more than 40 columns should be used. Columns 65-67 of the activity section of the card are at present unused, and can take up some slack, or changes in coding may be made to provide extra columns.

The types of data collected and their arrangement on punched cards will vary from library to library, depending on what information is desired. Since the coding of the punched cards is even more variable, only a suggested outline is given here. Detailed codes and classifications used at Lehigh may be found in the Appendices. Although it is impossible to foresee all eventualities, it was found useful to have pre-assigned codes as a starting framework. As the data were

analyzed, of course, more categories were needed in each classification, and adjustments and additions to codes were necessary. These changes, however, were not drastic; and having a priori codes made the organization of the data much easier. The codes used for a sample form are shown in the illustration of the "Form Card" in Figure 1.

1. Form Number (Columns 1 to 6)

The first three digits are coded to represent the primary purpose for which the form is used. This purpose is a sub-function of one of the five categories listed in the introduction to this manual. Only three digits are necessary, since the outline of these sub-functions is carried out to only three places. The basic classification of the coding is shown below.

100 Environmental

200 Acquisition activities

300 Organization activities

400 Formalizing the user's need

500 Matching need with facilities and material

An example of the breakdown and classification is:

300 Organization activities

350 Catalog maintenance

352 Public catalog

The Sextet Slip, copy 6, discussed under Section A above is generally used as a temporary entry in the public catalog. Its form number, therefore, begins with the digits 352.

The fourth, fifth, and sixth digits of the form

number are simply consecutive numbering of the forms as they come to the analyst's attention. It is assumed that a library will have no more than 999 significant forms to be analyzed. Otherwise the field will need to be enlarged.

In the case of multi-copy forms, all copies are assigned the same last three digits. The first three digits may vary, as the different copies of a form are used to perform different functions. In Figure 1, the form is given the number 352031; copy 5 of the same form is numbered 213031 because it serves a different purpose (it is sent as an order slip to the vendor).

2. Copy Number (Column 7)

The code number corresponds to the copy number. It is assumed that no form will have more than 9 copies. Single-copy forms are coded with a "0".

3. Name of Form (Columns 8 to 23)

This is the only alphabetic field on the punched card. Since it contains only 16 columns, it is necessary to abbreviate. A list of abbreviations is given in the Appendix.

4. Physical Size (Columns 24-25)

This is a preferred number code, with several standard sizes being assigned numbers arbitrarily. The 3" x 5" size of our form is coded "01" because it is the smallest of the sizes considered standard.

5. Physical Characteristics (Columns 26-28)

Forms are classified and coded according to their

format. The primary classification is shown below:

100 - Paper form

200 - Cardboard form

300 - Bound pages

400 - Unbound pages

500 - Microform

The sextet slip, a paper form interleaved with carbon paper, is coded "120".

6. Primary Function

This information is not coded separately, but is used to derive the first three digits of the form number already described. (See 1 above)

7. Secondary Function (Column 29)

This is coded as follows:

1 - Environmental.

2 - Acquisition of materials.

3 - Organization of materials.

4 - Formalizing need.

5 - Matching need with facilities and materials.

The secondary function of the sextet slip (example in Figure 1) to become part of the "New Books Received" file, is organizational in nature and is therefore coded with "3".

8. Point of Origin (Columns 30-34)

Column 30 shows a hierarchical classification of library personnel, beginning with "1" for the head librarian and descending to "8" for pages, student assistants, etc. The cataloger who originates the sextet

slip is on the fifth level of the hierarchy. It is helpful in this connection to draw an organization chart and scale from top to bottom.

Columns 31 and 32 indicate the internal department of the library; i.e.,

10 - Librarian's office

20 - Technical processes

30 - Reader's services

40 - Other departments

50 - Miscellaneous

This classification is further broken down; for example, the catalog department is coded "22".

If the form is originated externally, it is coded in columns 33 and 34, as follows:

10 - Borrower

20 - Other university groups

30 - Other libraries

40 - Vendors

50 - Donors of free material

60 - Job applicants

These classifications are subdivided to obtain the second digit; e.g., a student borrower is coded "12".

9. Point of Disposal (Columns 35-38)

This field is coded in the same manner as columns 30-34. Since the sixth copy of the Sextet Slip is destroyed in the catalog department where it originated, it is again coded "22" in columns 35 and 36.

10. Average Volume per Month (Columns 39-40)

Column 39 indicates the frequency of use of the form and/or seasonal peaks of activity. The form we have been discussing is used constantly, which, in this scheme is coded "0" in column 39. Column 40 has a preferred number code for the average volume. In our example, an average of 333 forms is used per month. Volumes between 100 and 499 are coded with "3".

An evaluation of the data so far generated can lead to such appraisals as the following.

a. More than one form used for the same purpose. By sorting the punched cards on columns 1-3, the number of forms performing the same function can be determined. If the form numbers are the same, and if the forms originate at the same point, there may be unnecessary duplication.

b. Some forms serve a minor purpose and their functions might be combined with others. The code for an unimportant function may be ascertained from the coding list. The use of many forms to do this job may be found by a sort on columns 1-3.

c. Opportunities for standardization. An unusally large number of forms of miscellaneous size (columns 24-25) or of differing physical characteristics (columns 26-28) may imply inefficiencies in handling forms and the use of unnecessary filing equipment.

d. Relative volumes of different types of forms. This information will be produced by a sort on columns 39-40.

V. Activity Cards

Activities involving forms may be divided into three types:

1. Communicatory or informative: originating, posting, verifying, obtaining or supplying information, or exercising judgment.

2. Repetitive: calculating, sorting, attaching to or detaching from other forms, reproducing, filing, interfiling, or file searching.

3. End-point: inserting into file or envelope, removing from file or envelope, storing, destroying.

These may be considered as three separate cycles, which we denote by A, B, and C. All three cycles run concurrently, but for purposes of analysis it may be wise to classify the operations. Activities of Cycle A are the most creative and require the greatest amount of human intelligence. The routine activities of Cycle B lend themselves most readily to mechanization. The least interesting and most marginal operations are those of Cycle C.

A. Data Collection

An Activity Card is generated for each activity in which a form is involved. This may be done by the analyst, or a supervisor may fill out a card for each activity occurring in his department. The originators of Integrated Procedures Control recommend that data be collected separately for each of the Cycles A, B, and C. This method has the advantage of allowing evaluations at the end of each cycle. If the analysis is to be done piecemeal, this is the better way,

particularly if the cycles are taken in order, with the more intellectual and interesting activities of Cycle A studied first and the least complex activities of Cycle C coming last. When it is certain that time will permit a complete analysis, it may be easier to study all cycles at once, thus eliminating some retracing of steps.

The activity card shown in Figure 2 contains the following information:

1. Cycle A B C

When all cycles are studied together it is helpful to indicate which general type of activity is being described on a card. While this information is implied in the space "Describe Activity," the analyst can manipulate the data collection cards more easily if he can determine the gross classification (A, B, or C) of the operations at a glance.

2. Name of Procedure

This information, although not coded, is an aid to the analyst in handling the activity cards. Some forms pass through many departments and are involved in more than one process. A one-word note of the process, such as "order," "circ," etc. serves as a clue to other information on the card.

3. Form and Copy Number

One of the hazards of the LISA system is that of getting the cards mixed up. Having the form and copy number on each card will help to prevent this.

ACTIVITY CARD - CYCLE (A) B C (Circle One)			522	41
NAME OF PROCEDURE				
Order			152	44
FORM NO.	COPY	OCCURRENCE ORDER NO. (68)		
352031	6	01 0000 0000	1	47
PERSON PERFORMING ACTIVITY (41)			208	
Cataloger				
DESCRIBE ACTIVITY (44)			6	
Types 6-part slip				52
CYCLE A. WHAT IS WRITTEN ON FORM DURING THIS ACTIVITY? (47)				
Complete bibliographic info.				
CYCLE A OR B. IS ANOTHER FORM INVOLVED IN THIS ACTIVITY? NAME OF FORM (52)			03	59
No				
CYCLE C. IS FORM MOVED DURING THIS ACTIVITY? TO WHAT DEPARTMENT? (52)			0138	61
No				
FREQUENCY (59)		TIME REQUIRED (61)		65
333 average/month		13.8 seconds		
IS THIS ACTIVITY ALWAYS DONE IN PROCESSING OF THIS FORM? IF NOT, EXPLAIN FULLY			01 0000 0000	68
Yes				
CYCLE A. WHAT DECISIONS REQUIRING JUDGMENT ARE MADE?				
None				

Figure 2. Sample of Cycle A Activity Card

4. Occurrence Order Number

A ten-digit internal occurrence order number provides a means of keeping the activity cards, and later the punched cards derived from them, in sequential order.

a. The first two digits denote the sequence of steps. The activity described on the card in Figure 2 is the first one performed on the form. The internal occurrence order number is therefore 0100000000.

b. The next four digits signify exceptions and can be compared to loops or branches on a flow chart. The first two of these digits show the reason for the exception, and the next two the steps within that particular loop or branch. The second operation undergone by copy 6 of the Sextet Form is its transmittal to the acquisitions department. This is the second step, so the internal occurrence order number is 0200000000.

c. However, at Lehigh, if a book is cataloged and bibliographic information searched for at the same time, the slips remain temporarily in the catalog department. The first step in this procedure is the separation of slip #6 from the other copies. Figure 3 illustrates the activity card describing this step. The internal order of occurrence number is 0255010000 - 02 for the step from which this one is a branch; 55, a code number representing the

ACTIVITY CARD - CYCLE A (B) C (Circle One)			522	41
NAME OF PROCEDURE				
Order			550	44
FORM NO.	COPY	OCCURRENCE ORDER NO. (68)		
352031	6	02 5501 0000 330		47
PERSON PERFORMING ACTIVITY (41)				
Cataloger				
DESCRIBE ACTIVITY (44)				
Separates from other septet slips - by hand			21	52
CYCLE A. WHAT IS WRITTEN ON FORM DURING THIS ACTIVITY? (47)			4031	
—			1	
CYCLE A OR B. IS ANOTHER FORM INVOLVED IN THIS ACTIVITY? NAME OF FORM (52)			02	59
Septet slip #1				61
CYCLE C. IS FORM MOVED DURING THIS ACTIVITY? TO WHAT DEPARTMENT? (52)				
no				65
FREQUENCY (59)		TIME REQUIRED (61)		
less than 100/month				68
IS THIS ACTIVITY ALWAYS DONE IN PROCESSING OF THIS FORM? IF NOT, EXPLAIN FULLY			02 5501 0000	
no - only when temporary cataloging done at time of search				
CYCLE A. WHAT DECISIONS REQUIRING JUDGMENT ARE MADE?			330	
None				

Figure 3. Sample of Cycle B Activity Card

reason for the branch; and 01, the first step in the branch. The reasons for variations in procedures are classified roughly as follows (55 in this example):

01 - 29 - Variations in form or use of graphic materials

30 - 49 - Variations in method of acquisition of materials

50 - 69 - Variations in methods of processing materials

70 - 79 - Variations in circulation procedures

80 - 99 - Miscellaneous variations

As explained above, the reason for the change in the illustrated activity is that temporary cataloging is done at the time of searching, which variation is coded "55".

If a loop contains another loop, four more digits are used to describe the sub-loop.

When two or more forms are handled together, as in interfiling, some sorting, or attaching one form to another, a common three-digit external order of occurrence number is indicated on the appropriate activity card for each form. This is comparable to a line number on a flow chart. These numbers are roughly chronological. Suggested general classifications for various processes are:

100 - 199 - Administrative, personnel

200 - 299 - Order, receiving

300 - 399 - Cataloging, binding

400 - 599 - Circulation

600 - 699 - Photocopying, billing, reserves

700 - 799 - Interlibrary loan

900 - 999 - Statistics

In Figure 3, 330 is assigned as an external order number, because six forms are handled together during the temporary cataloging process.

5. Person Performing Activity

In both activities represented this person is a cataloger.

6. Describe Activity

This short statement should indicate not only what is done, but how it is done. In Figure 3, the fact that the slips are separated by hand is entered, because there is a possibility that this could have been done mechanically.

7. What Is Written on Form

This space is used only on Cycle A cards. It will be necessary in most cases only to indicate the type of information and not the exact words. (See Figure 2.)

8. Other Forms Involved in Activity

Generally this information is noted when the operations of sorting, interfiling, attaching, separating, or consulting other forms are involved. Since Sextet Slip #1 is involved in the operation represented by Figure 3, this is shown.

9. Movement of Form

This space is used only for movements of a form from one department to another, or to some person or institution external to the library.

10. Frequency

This may be the same as "Average Volume per Month"

on the form card. When quantities of the same form are handled together, as in sorting or filing, the number will reflect daily, weekly, or other frequencies and the quantity of forms handled at one time.

11. Time Required

The time needed to perform each activity on a form may be obtained from work sampling, from time and motion studies, or from predetermined time standards. Unfortunately, there are few standards available for the more intellectual and time-consuming activities carried on in a library. A useful listing of standards for some clerical tasks is "Standard Times for Certain Clerical Activities in Technical Processing," by Henry Voos.[4] The typing activity described in Figure 2 requires, for example, an average of 13.8 seconds, as extrapolated from material in Voos' dissertation. The time required to detach the forms (Figure 3) was not considered important in this study and consequently was not estimated.

12. Alternatives to Performance of an Activity

Here are written the explanations and the events of the loops mentioned under "Occurrence Order Number," (See 4 above.)

13. Decisions Requiring Judgment

Since it is impossible to codify judgments, there are no numerical equivalents to entries in this space. Intellectual, decision-making judgments are generally dependent on local traditions and will vary from one library to another. Space has been left for each library to devise its own code.

B. Coding

As with the form cards, entries are coded along the right-hand edge of the card, with column numbers for punched cards given both after the data headings and on the edge. Because the data from the form cards are reproduced in the first 40 columns of each punched card for activities, coding for the activity cards is restricted to columns 41 to 80. (See Appendix C for complete code.)

1. Person Performing Activity (Columns 41-43)

The same code is used in this field as for the first three digits of the "Point of Origin" field. (See IV, B, 8.) Because a professional cataloger performs the operations shown on the examples in Figures 2 and 3, columns 41-43 of both cards are coded "522".

2. Description of Activity (Columns 44-46)

The first digit of this field indicates the cycle of the operation as shown below:

a. Cycle A

100 - Origination - first writing on form.

200 - Posting - additional information entered on form.

300 - Mental activities, such as verifying, obtaining or supplying information, or exercising judgment.

b. Cycle B

400 - Sorting, filing, interfiling, shelving, and searching.

500 - Attaching or separating forms.

600 - Calculating and reproducing.

c. Cycle C

700 - Inserting or removing from file, envelope or shelf; destroying.

800 - Moving.

900 - Delays or unanalyzed activities.

The second and third digits are for further classification.

Figure 2 has the number 152 in this field. The "1" indicates a writing activity of Cycle A; the "52" that the information was typed on another form and produced this form as a carbon copy. Figure 3 has the number 550 - "5" for cycle B and "50" for separation.

3. Writing Reference (Columns 47-51)

The codes for the items written are set up in such a way that it is usually possible to use one code for a given combination of writings. When the items written are so diverse that one code will not cover them all, each item is coded separately. In such cases, the entire sequence of writings is considered as one activity, but each item written is coded chronologically in column 47. The first writing is coded with "1", the second with "2", etc. However, each card of the sequence receives the same occurrence order number.

Columns 48-50 are for coding the type of information written. The basic classification is:

100 - Personal information, such as initials, name and address, etc.

200 - Bibliographic information, broken down into various combinations of call number, author, title, publisher, etc.

300 - Information peculiar to Lehigh University, such as the name of the university, or the words "Honeyman Collection."

400 - Statistical information.

500 - Financial information.

600 - Miscellaneous information.

Weighting factors from 1 to 9 based on time and complexity of operation are punched in column 51.

The coding of this field in Figure 2 reveals that this is the first of plural writings, and that what is written is complete bibliographical information, which has a weight of 6.

4. Form or Move Reference (Columns 52-58)

This field is generally used as a form reference. Figure 3, for example, indicates that Sextet Slip #6 is separated from Sextet Slip #1. The number of this form, 214031, is written here.

When the field is used as a move reference, columns 52 and 53 are coded with a preferred number code to show the distance moved. Columns 54-57 show the internal department or external institution to which the form is moved. The coding for these columns is the same as that for columns 31-34. (See IV, B, 8 above)

5. Frequency (Columns 59-60)

The same code is used here as in columns 39-40. (See IV, B, 10 above)

6. Time Required (Columns 61-64)

Numbers in these columns correspond to the number of

seconds, minutes or hours needed to perform the operation on one form or on all forms handled in a month. One unit of time should be used consistently throughout the analysis. In the Lehigh study "seconds" was chosen and, in Figure 2, the number of seconds required to originate one form is recorded in this field.

7. Occurrence Order Number (Columns 68-80)

Columns 68-77 are for recording the ten-digit internal occurrence order number and columns 78-80 for the external occurrence order number, if any. (See V, A, 4.)

VI. Evaluation of System

Because many of the forms must be traced through a multitude of activities, it is frequently necessary to make flow charts of the operations needed to process a form. Such a flow chart of the first five operations performed on the Sextet Slip copy no. 6 of the example is shown in Figure 4. A print-out of the punched cards describing the same operations is shown in Figure 5.

The deck of punched cards is in essence a flow chart, and the entire deck describing all forms and their activities is a flow chart of all of these processes. The complete print-out of the activities undergone by this one form contains 32 lines, not an unusually high number per form. It can be readily seen that the punched card deck is considerably more flexible and easily handled than a corresponding flow chart.

A print-out listing of the cards can reveal such information as, for example, the number of people who use or handle each copy of a form (columns 41-43); or what happens when a

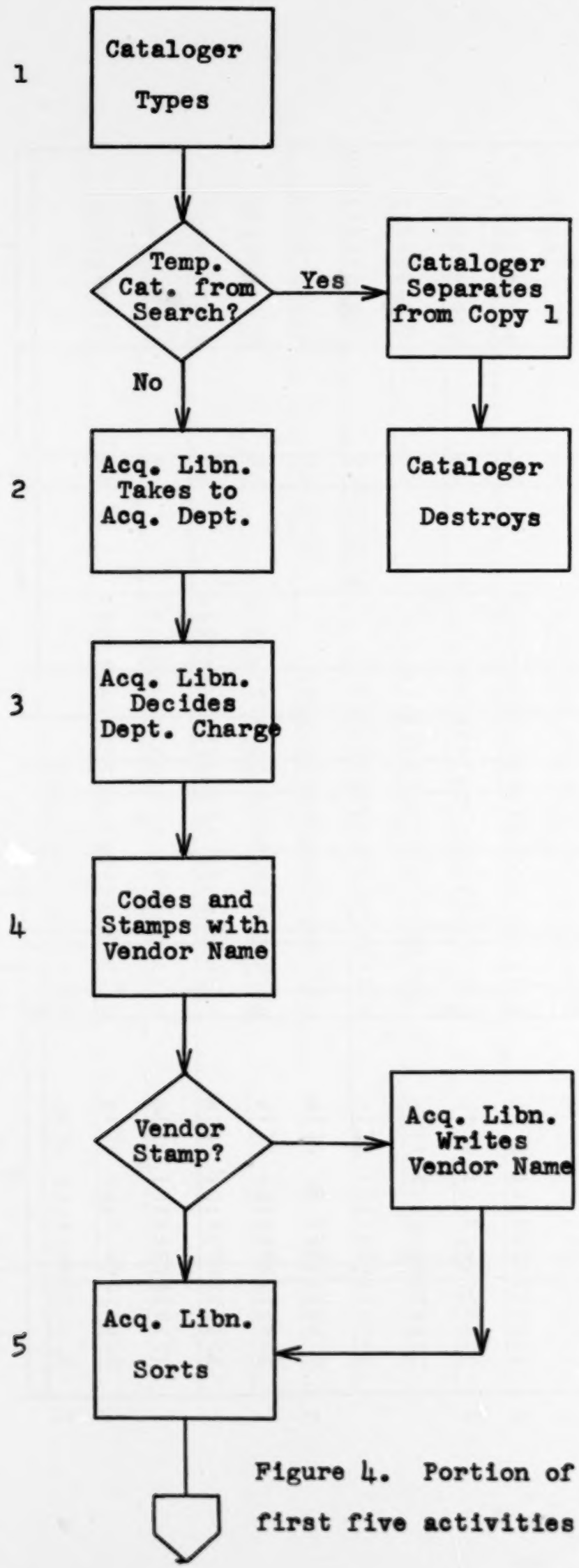

Figure 4. Portion of flow-chart showing first five activities of Sextet Slip Copy 6.

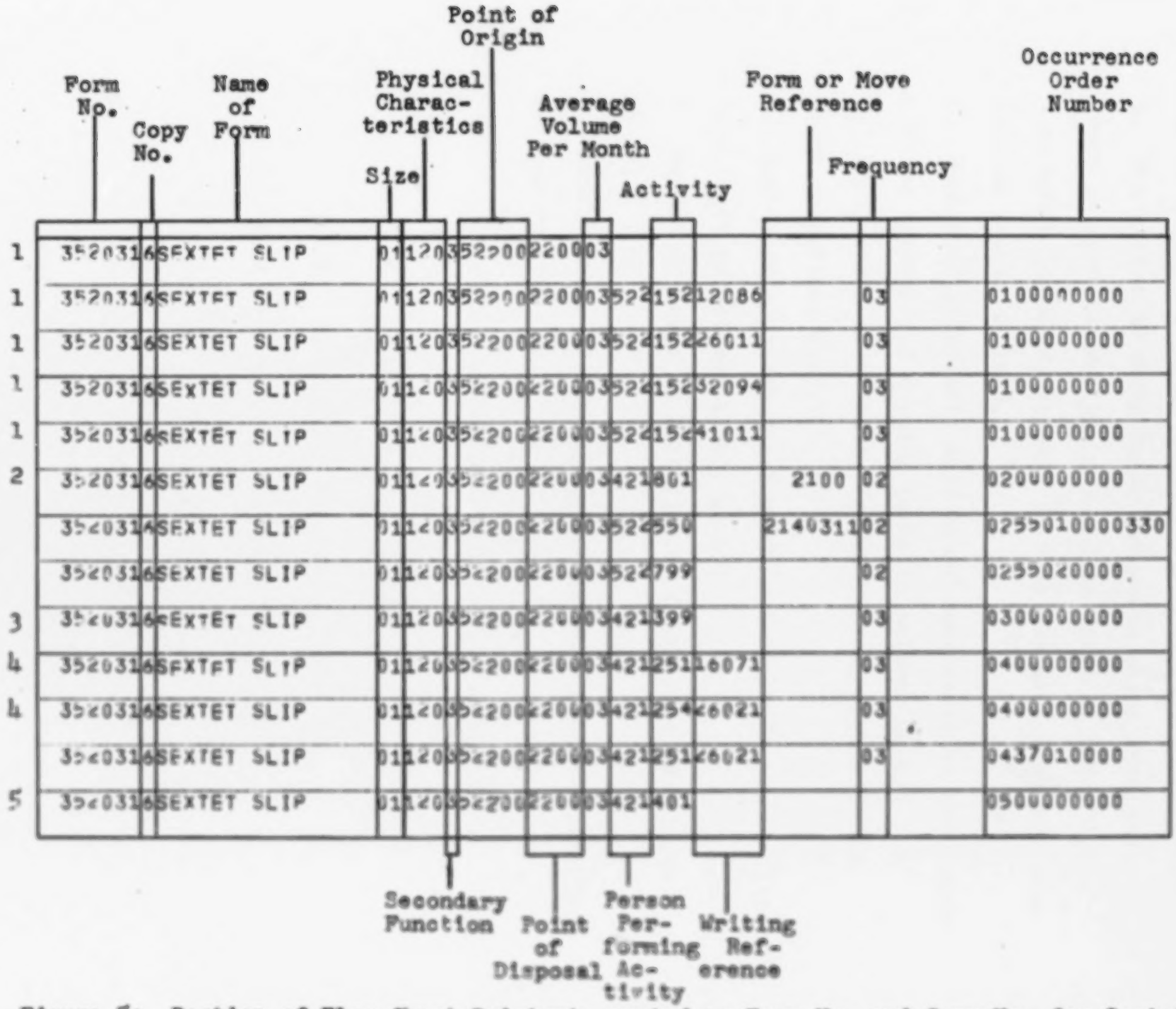

Figure 5: Portion of Flow Chart Printout, sorted on Form No. and Copy No. for Sextet Slip. Numbers in left hand column are keyed with Flow Chart on Figure 4.

given procedure is changed (columns 70-77). The entire deck can be sorted in different ways for a variety of purposes:

A. The extent to which human judgments enter into processing. (Sort on card columns 44-46 and list cards on which "399", i.e. human judgment, appears in this field). Figure 6 is a limited sample of this.

B. Number of repetitive activities that could be mechanized such as sorting and merging (sort on columns 44-46).

C. Duplication of the same information on several forms (sort on columns 47-51).

D. Number of clerical tasks performed by professional librarians (sort on columns 41-43, 44-46).

E. Amount of usage of a particular file (sort on columns 44-46).

F. Total number of exceptions to standard routines (sort on columns 70-77).

Activity-Exercise of Judgment-399

JUN 30 65 13 32.8			
2140311SEXTET SLIP	01120 5220022000342139	03	0300000000
3510312SEXTET SLIP	01120 5220022000342139	03	0300000000
3520313SEXTET SLIP	01120 5220022000342139	03	0300000000
2210314SEXTET SLIP	0112035220022000342139	03	0300000000
0213035SEXTET SLIP	0112035220000400342139	03	0300000000
3520316SEXTET SLIP	0112035220022000342139	03	0300000000
2140300PROC CD	0320027210021000442139	02	0130000000
3500911LC DEP ITEM CD	01200 9000312000142139	01	0200000000
3020912LC DEP ITEM CD	01200 9000310031014213	01	0200000000
4101090ROLL NOTE TAPE	99130 9330033000053		0200000000
4201110SRC> REC-BK	0120029001031000342139		2000000000
4201110SRC> REC-BK	0120029001031000342139		3100000000
500115008K	9930059004030000542139	05	0200000000
500115008K	9930059004030000511	02	0330000000
500115008K	9930059004030000552	05	0700000000
500115008K	9930059004030000552	03	0650000000
500115008K	9930059004030000553	01	1400000000
500115008K	9930059004030000553	04	2600000000
5001160SER	9930059004030000542139	15	0200000000
5001160SER	9930059004030000552	02	0310000000
5101170MICRO	99500 9000437000342139	03	0200000000
5101170MICRO	99500 9000437000352	03	0700000000
5211400BK CD	0120037200320000931	07	0000000000
5211440DATE CUR SLIP	01140 7220032000093139	07	0200000000
JUN 30 65 13 32.8			

Figure 6: Portion of Printout showing cards sorted by activity, in this case "Exercise of judgment."

PART II

ANALYSIS OF LIBRARY USE

I. Introduction

The deck of punched cards prepared in the first part of the analysis forms a model of a "back door" approach to the library. This approach is concerned with the processing and flow of physical items which lend themselves to measurement. A second approach starts at the "front door," with the interaction of the user and the library. Service to the user is the primary mission of the library, and how well this mission is accomplished is the eventual measure of the effectiveness of the system. Any model of a library, therefore, should include information about how well it satisfies its users.

The user is anyone who places a demand on the library's collection, space, or services. He may be physically present, or he may communicate with the library by telephone, letter, or other means. When studying the user's informational needs, we are really concerned with such problems as:

1. The relationship of his stated question to his actual need;
2. The translation of the language of his question into the library language of subject headings, index terms, etc.;
3. Changes in his need and/or in his question that may occur during the search process;
4. Search strategies used by persons of different levels of experience and background.

This is an ill-defined and ambiguous area and one not easily quantified. Traditionally libraries have attacked the problem by counting reference questions and classifying them by type, subject, or the amount of time required to answer them; or by

analyzing the questioner and the degree to which his expressed want was satisfied.

II. Data Collection

Information about the user was elicited at Lehigh through questionnaires and interviews. A preliminary, open-ended questionnaire was given to people entering the library at random times during a "typical" week. This was designed to obtain the user's own views, expressed in his own idiom, about his needs. Respondents were asked to describe the purposes of their visits, and all other uses they make of library facilities.

A two-part numbered questionnaire followed. One part was answered by members of the reference staff, who described the type of question asked and the information sources used or to which the user was directed. The user answered the other half, indicating his degree of satisfaction with the results of his search and, if unsuccessful, possible reasons for his lack of success. This questionnaire was given to only a few patrons, because of a desire not to overload the professional staff at the Lehigh reference desk. Results obtained from the limited sample were interesting enough, however, to suggest that the method has possibilities for further refinement and use.

The most complete and satisfactory method of data collection was an interview, a copy of which is reproduced in Appendix E. The interview was administered to people leaving the library. Check-off sheets were given to the interviewee for his use in answering five of the questions in order to prevent hints from the interviewer and to keep the questions from being completely open-ended.

The interviewer sought the following information:

A. Reason for Visiting the Library (questions 1, 3)

The first question sets the stage for the interview and separates persons seeking information and planning to use library materials from those whose errand is simply to return a book, read the daily newspaper, etc. The second question (number 3 of the interview) attempts, after the subject has identified himself, to narrow down the object of the search for information. Coding of the answers to these questions is described below in Section III, B.

B. User Characteristics (question 2)

Users are classified by institution, status, and, if Lehigh personnel, by department. (For coding, see Section III, A.)

C. Library Materials Used (question 4)

Sources used for leads to material, such as catalogs and indexes, as well as categories of the materials themselves, are listed on a separate questionnaire sheet to be checked off by the user. (For coding, see Section III, C.)

D. Areas of the Library Visited (question 5)

Departments, offices, and collections visited are indicated by the patron on a separate check-off sheet. (For coding, see Section III, D.)

E. Forms Signed or Filled In (question 6)

In order to tie in the information about the user with the rest of the systems analysis described in Part I - Systems Analysis of Library Processes - interviewers asked patrons to indicate which library forms they signed or filled out during their visits. These forms will belong to categories four and five of

the system model (Formalizing and Matching activities), and will, of course, comprise only a small percentage of the total number of forms. (For coding, see Section III, E.)

F. Time Spent on Search (question 7)

Time periods of less than 15 minutes, 15 to 30 minutes, 30 to 60 minutes, and more than 60 minutes are suggested. (For coding, see Section III, F.)

G. Change of Objective or Additional Purposes Accomplished (question 8)

Frequently patrons perform more than one activity during a visit to the library. A survey carried out at Lehigh University, for example, showed that there were 3.0 use-events per person per visit.[5] This may be because a user has several missions in mind when he enters the library, or because some event during his visit causes a change in focus, approach, or objective. (For coding see Section III, G. The coding of additional purposes is done in the same way as is the original purpose. See Section III, B.)

H. Reasons for a Change in Goal (question 9).

The subtleties involved in a change in the purpose of a search are not easily described, but it is possible to indicate some of the more common reasons. (For coding, see Section III, H.)

I. Persons with Whom Patron Talked (question 10)

This question is answered only when information-seeking has been discussed, either with library personnel or with others. (For coding see Section III, I.)

J. Measure of Success (question 11)

Users were asked to rate their success on a linear scale from 1 to 4, ranging from complete success to utter failure. (For coding see Section III, J.)

K. Reason for Lack of Success (question 12)

Relative or complete failure is attributed by the user to one or more of several factors. (For coding see Section III, K.)

It is suggested that techniques of gathering data of this sort be applied randomly during an extended period of perhaps one to three months. A longer period will probably require the use of questionnaires rather than interviews. The interviewer at Lehigh, a graduate student in Psychology, found that five or six interviews could be done in an hour.

III. Coding

Because of the cumbersome nature of the interview form, coding on it, as was done on the Form and Activity Cards, was impractical. A separate coding sheet was devised, based on a punched-card layout form. This has the advantage of ease of handling for the coder and convenience for the keypuncher. The codes and classifications used at Lehigh are listed in Appendix D. Code numbers for each of the items in questions 4, 5, 6, 11, and 12 are also shown on the Interview Sheets (pages E-4, E-5, and E-6) to save a step in the coding process for these questions.

The coded information learned in interviews 58 through 67 are shown in Figure 7.

A. User Characteristics (columns 1 to 4)

The first column denotes the institution represented by

the user and is given a preferred number code as follows:

1 - Lehigh University

2 - Other institutions of higher learning

3 - High school

4 - Industry

5 - Other

Column 2 contains information about the academic status of the user if he is from an academic institution, as:

1 - Faculty or staff

2 - Graduate student

3 - Senior

4 - Junior

5 - Sophomore

6 - Freshman

7 - Unspecified undergraduate (people not affiliated with Lehigh were not asked their class)

If the borrower is affiliated with Lehigh, columns 3 and 4 indicate his college or department:

01 - College of Arts and Science

02 - College of Business Administration

03 - College of Engineering

04 - Department of Education

05 - Administrative staff

06 - Special curricula

Two digits are allotted for this information, since some universities may wish to break down their colleges into departments.

On line 58 (the first line in the illustration) this field is coded "1201" - "1" for Lehigh, "2" for graduate student, and

"01" for College of Arts and Science.

B. Purpose of Visit (columns 5-18)

This field is divided into two smaller fields - Information-seeking and Other. Two sub-fields are allotted to each of these, for users who perform several tasks.

1. Informational questions may be of several types but, in theory, they may all be answered from materials owned by or accessible to the library. Two fields are allowed here, of four columns each (columns 5-8 and 9-12).

The first digit in each of these fields shows the type of information sought; i.e.,

1 - Specific fact

2 - Specific book (s)

3 - Specific journal article (s)

4 - Material on a specific subject

5 - Current awareness of a specific subject

6 - Bibliographic material

Digits 2, 3, and 4 of each field (columns 6-8 and 10-12) indicate the subject of the information as classified by the Dewey Decimal System, using the three digits to the left of the decimal point. (This code, of course, will be used only by libraries who use this system.)

On line 58 in Figure 7, the code "6619" is used in columns 5-8. The user wanted bibliographic material (coded "6") on diseases of laboratory rats (coded "619" for Comparative medicine - Study of diseases and their treatment in laboratory animals).

2. "Other" encompasses such activities as browsing,

Interviewer ID	User Characteristics	User's Purpose: Information-Seeking	User's Purpose: Other	Sources Used: Catalogs, Indexes, etc.	Sources Used: Graphic Materials, etc.	Areas Visited	Forms Used	Time Spent	Changes of Goal	Reasons	Personnel Consulted	Time of Success	Reason for Lack of Success
58	1201	6619	930	01 02	07 10 11	21 36 33 24 500 600	$2.11430 $2.11450	30	-	431	525	912	2 -
						93 35	24.06.71 4.30.1130						
59	1303		100		07 11	81 500 600		40	-				1 -
60	1903	4536			07	536		10	-				2 -
61	1204	4327			01 06	81 21	$28.1610	10	-				1 -
62	27 -		200	03	07	36 518 528	$2.11470	20	-				2 -
63	1204	4324		06		29		10	-				1 -
64	1201	2017	100	01		21 36 517	$24.1640	20	-	921			32
65	1203	6621		01 02 03 04 05 06 07 10 11		81 21 36 23 621	$2.11430 $2.81610	40	-	921	523		2 -
C				06		29 24 93	$2.11470						
66	1201		700			21		10	-	431			1 -
67	1904		100	01	07	36 327		40	-				2 -

Figure 7. Excerpt from coding sheet for user interviews

pleasure reading, reading reserve books, returning books. These are classified and coded, in columns 13-15 and 16-18, as follows:

100 - Browsing.

200 - Pleasure reading.

300 - Receiving instruction (in use of catalog, indexes, etc.)

400 - Requests for action, from the order department, from the circulation department, Xerox desk, inter-library loan desk.

500 - Questions on library procedure, for example library hours, gift policy.

600 - Directional questions.

900 - Other.

The user described on line 58 of the illustration also had some material Xeroxed, so "430" is entered in columns 13-15.

C. Sources Used (columns 19-38)

This field is also broken down into subfields, one for catalogs, indexes, and other sources used for leads to information and another for graphic materials in which information is sought.

1. Catalogs, indexes, etc.

These sources are assigned a preferred number code which is shown in Appendix D and on Interview Sheet #1 in Appendix E.

The patron of line 58, Figure 7, used the Author Catalog and the Serials Catalog, which are coded "01" and "03", respectively.

2. Graphic materials, etc.

A preferred number code (see Appendix D and Interview

Sheet #1) is used for this field also.

Patron #58 used books from the stacks, coded "07"; bound periodicals, "10"; and unbound periodicals, "11".

D. Areas of the Library Visited (columns 39-52)

1. The first eight columns (39-46) are divided into two-column fields which are assigned the same code used on the Form Cards for the internal point of origin of a form (columns 31-32). In cases where there was no preassigned code for an area, two-digit codes beginning with "8", as "81", "82", and "83" are used. If the patron visited the stacks, this is not shown here, but in columns 47-52 (see "2" below).

In the illustration, the patron described by line 58 visited the reading room, coded "81"; the card catalog, "36"; the serials catalog, "24"; the periodicals section, "83"; and the Xerox machine, "35". Because he visited an unusually large number of departments, it was necessary to punch a second card for the data concerning his visit.

2. The second 6 columns are composed of two 3-column fields. These fields are reserved for recording the stack areas visited. As in the fields indicating the subject of the information sought, the first 3 digits of the Dewey Decimal classification are used. Patron 58 visited the 500 and 600 sections of the stacks. This patron, and his interviewer, were unfortunately not sufficiently specific for any conclusions to be drawn from these data. Ideally it would be possible to compare the code for the area visited with that for the information sought. In line 60 of Figure 7, the subject of the information sought is

coded 536 (the patron wanted material on heat transfer). He went to the 536 section of the stacks, and it can be assumed, therefore, that he found the right place.

E. Forms Signed or Filled Out (columns 53-66)

The same code is used in these two fields as in the Form Number (IV-B-1). Line 58 shows that the patron signed or filled out a book card, a periodical charge card, a Xerox slip, and an inter-library loan request form.

F. Time Spent on Search (column 67)

As described in VII-A-6, any of four time periods may be indicated. A "1" in column 67 represents the shortest period (less than 15 minutes), and a "4" the longest (more than 60 minutes). The "3" in this column on line 58 shows that the user spent 30 to 60 minutes on his search.

G. Change in Goal (column 68)

If the goal changed during the search for information, this fact is coded by a "1" in column 68. Otherwise a "0" is entered. When the interview was prepared, it was hoped that useful data on changes in objectives could be obtained which would give some insight into the causes and effects of serendipity. This was unsuccessful. Only a few of the interviewees at Lehigh indicated that their objectives had changed while they were in the library, although a larger sample might have produced more satisfactory results.

H. Reason for Change in Goal (column 69)

Possible reasons are assigned preferred-number codes; for example,

1 - Found unexpected information

2 - Unable to find answer to original question

3 - Error in formulation or conception of question

4 - Circumstances beyond patron's control

5 - Decided another objective more worthwhile

I. Personnel Consulted (columns 70-78)

This field contains three subfields of three columns each. When library personnel are involved, the three digits used for Point of Origin - Internal (columns 30-32) of the Form Card (see IV-B-8) are assigned. For non-library personnel "911" is used for faculty members, "912" for students, and "919" for other. The patron being described talked with the circulation librarian, the reference librarian, and a fellow student.

J. Measure of Success (column 79)

Since success is measured by the user on a linear scale, code numbers range from "1" - complete success, to "4" - utter failure. Patron 58 felt that he was successful, although not completely, and indicated this by checking choice number 2.

K. Reasons for Lack of Success (column 80)

Possible reasons are coded as follows:

1 - Material not owned by library

2 - Material not available (in circulation, etc.)

3 - Too much material

4 - Not enough material

5 - Inability to find the appropriate member of the library staff

6 - Inability to describe need to the library staff member

9 - Other

IV. Evaluation of Library Use

When the cards have been punched from the coding sheet, several of the traditional types of analysis of user needs,

activities, and satisfaction can be performed by sorting the punched card deck in various ways. Users may be classified by status or department (sort on columns 1-4); requests may be classified by type or subject area (columns 5-12). Library personnel involved in a search (columns 70-78); materials and facilities used (columns 19-38); traffic in various areas (columns 39-52); and the frequency of successful or unsuccessful searches (column 79) may also be studied.

The most interesting and helpful investigation of the coded information is probably concerned with those entries which indicate a lack of success and their relationship to other data. For example, the Lehigh interviews showed that none of the people who felt that their searches had been completely unsuccessful (a "4" in column 79) had consulted any library staff member above the level of student assistant. Although some of them had visited many parts of the library and had consulted several sources, it was possible for a professional librarian (a non-staff member) to discover from the data that these unsuccessful users had missed several good bets during their searches. For example, a patron who is looking for a journal article and uses no periodical indexes or bibliographies (columns 19-28) may be doomed to a fruitless search. Correlating the stack section visited with the subject area, discussed above in Section III, D, 2 is another way of approaching this problem.

FOOTNOTES

1 For example, see Edward Mack McCormick, "Trends in the Use of Computers for Information Processing," American Documentation, 13:182-184 (April 1962) and Robert S. Taylor, Bibliography of Recent Reports and Books on Library Automation and Library Systems Analysis (Library Systems Analysis Report Number 1). Bethlehem, Pa., Lehigh University, Center for the Information Sciences, 1964.

2 Wallace J. Richardson and Robert E. Heiland, "Integrated Procedures Control: A New System for Analysis, Measurement, and Control of Office Work." A.M.A., Office Management Series No. 143 (1956), pp. 23-49.

3 Wallace J. Richardson and Robert E. Heiland, Integrated Procedures Control Manual, 1958.

4 Henry Voos, Standard Times for Certain Clerical Activities in Technical Processing, Rutgers, 1964.

5 Robert S. Taylor, Library Use Survey, March 4-March 10, 1964. (Unpublished)

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Appendix A: Punched Card Fields--Total System

Form Card

Col.	1- 6	Form number
	1-3	Primary function
	4-6	Consecutive numbering
Col.	7	Copy number
Col.	8-21	Name of form abbreviated
Col.	24-25	Size
Col.	26-28	Physical characteristics
Col.	29	Secondary function
Col.	32-34	Point of origin
Col.	35-38	Point of disposal
Col.	39	Frequency of use, seasonal activity
Col.	40	Average volume per month

Activity Card

Col. 41-43	Person performing activity
Col. 44-46	Activity
Col. 47-51	Writing reference
Col. 52-58	Form or move reference
Col. 59-60	Frequency
Col. 61-64	Time required
(Col. 65-67	Open)
Col. 68-77	Order of occurrence - internal
Col. 78-80	Order of occurrence - external

User Card

Col.	1- 4	User characteristics
Col.	5-18	Information-seeking activities
Col.	19-38	Sources used
	19-28	Catalogs, indexes, etc.
	29-38	Graphic materials, etc.
Col.	39-52	Areas visited
Col.	53-66	Forms signed or filled out
Col.	67	Time spent on search
Col.	68	Change of goal
Col.	69	Reason for change of goal
Col.	70-78	Personnel consulted
Col.	79	Measure of success
Col.	80	Reason for lack of success

Appendix B: Punched Card Coding (Form Card)

This is a suggested code only. It has been found adequate at Lehigh and at the other libraries in which LISA was tested. Most of the codes are sufficiently open-ended to allow for additions and modifications.

Form Card

Form Number - 6 columns

Columns 1-3 - Primary function of form

100 - Environmental

110 - Decision making and planning

120 - Studies

130 - Personnel
131 - Hiring
132 - Firing
133 - Payment

140 - Reporting

150 - Communication

200 - Acquisition

210 - 229 - Graphic materials
211 - Request
212 - Searching
213 - Purchase
214 - Recording
215 - Receiving
216 - Rejection
217 - Claim
218 - Report to borrower (faculty member or other) and vice versa
219 - Vendor correspondence
220 - Standing order
221 - Catalog cards
222 - Desiderata
223 - Gifts
224 - Free material

230 - Supplies and equipment
231 - Request
232 - Purchase
233 - Receiving

240 - Budget control
241 - Billing
242 - Records
243 - Reporting

250 - Shipping

260 - Routing

300 - Organization activities

310 - Cataloging

320 - Classifying

330 - Marking
331 - Pasting
332 - Labeling

340 - Collection maintenance
341 - Shelving
342 - Locating
343 - Weeding
344 - Storage
345 - Binding
346 - Mending
347 - Splicing
348 - Replacing (of media)
349 - Replacing (of materials)

350 - Catalog maintenance
351 - Shelf list
352 - Public catalog
353 - Serials catalog
354 - Films catalog
355 - Recordings catalog
356 - Departmental catalogs

360 - Union catalogs
361 - Regional union catalog
362 - Library of Congress catalog
363 - Interdepartmental (or member library) union catalog

370 - Exhibits

399 - Miscellaneous files

400 - Formalizing

410 - Reference

420 - Circulation

430 - Interlibrary loan

500 - Matching

510 - Reference

520 - Circulation
521 - Circulation of stack material
522 - Circulation of reference material
523 - Reserve books
524 - Recall or overdues
525 - Registration

530 - Interlibrary loan
531 - Lehigh borrowing
532 - Lehigh lending

540 - Photoduplication
541 - Xerox
542 - Lehigh Photoduplication Service
543 - Photoduplications from other libraries

Columns 4-6 - Consecutive numbering of forms

Copy Number - 1 column

Column 7 - Number of copy. If single copy form, use 0.

Name of Form - 16 columns

Columns 8-23 - Name of form. Use abbreviations listed below.

Acct - Account
Acq - Acquisitions
Ack - Acknowledgment
Ann - Annual
Appl - Application
Appt - Appointment
Asst - Assistant

Bd - Bound
Bgt - Budget
Bib - Bibliography
Bind - Bindery
Bk - Book
Bldg - Building
Bor - Borrower

Canc - Cancellation
Cat - Catalog
Cd - Card
Cert - Certificate
Ch - Check
Chg - Charge
Circ - Circulation
Cl - Closed
Cler - Clerical
Clm - Claim
Coll - Collection
Cont - Continuation
Coop - Cooperative
Corp - Corporation
Cpy - Copy
Cum - Cumulative
Cur - Current

Da - Daily, Day
Dept - Department
Dep - Depository
Diss - Dissertation
Doc - Document

Emp - Employment
Exmpt - Exemption

Fac - Faculty
Fm - Form
Fol - Follow

Geog - Geographic
Gov - Government
GPO - Government Printing Office

Hr - Hourly

ILL - Interlibrary Loan
Info - Information
Ind - Industrial
Inv - Invoice

LC - Library of Congress
Leh - Lehigh
Lib - Library
Libn - Librarian
Lnd - Loaned
Ltr - Letter

Micod - Microcard
Micfm - Microfilm
Micro - Microforms
Mkt - Market
Mo - Monthly

News - Newspaper
Not - Notice
Notif - Notification
NUC - National Union Catalog
Numb - Numbered

Op - Open
Ord - Order
OTS - Office of Technical Services

Pa - Paper
Pam - Pamphlat
PC - Post card
Per - Periodical
Photo - Photoduplication
Pol - Policy
Proc - Processing
Prof - Professional
PS - Pressure-sensitized
Pub - Publisher
PUC - Philadelphia Union Catalog

Quad - Quadruplicate slip
Ques - Question
Quot - Quotation

Rec - Record
Recm - Recommendation
Ref - Reference
Rej - Rejection
Ren - Renewal
Req - Request
Reqn - Requisition
Res - Reserve
Rest - Restricted
Rpt - Report
RS - Readers' Services

Ser - Serial
Sh - Sheet
S-H - Stechert-Hafner
Sl - Shelf list
Srch - Search
Stat - Statistics
Std - Standing
Stud - Student
Subs - Subscription
Svc - Service

Term - Termination
Tng - Training

USBE - US Book Exchange

Voc - Vocational

WT - Withholding tax

Size - 2 columns

Columns 24-25 (Applies only to sizes of paper or cardboard forms)

01 - 3 x 5
02 - 5½ x 3-3/8 (post card)
03 - 7-3/8 x 3-1/4 (punch card)
04 - 4 x 6
05 - 5 x 8
06 - 5½ x 8½
07 - 8½ x 11
99 - Miscellaneous and/or irrelevant

Physical Characterisitics - 3 columns

Columns 26-28

100 - Paper form

110 - Single copy (includes carbon copies when made on same form as original and when the copies serve different purposes from that of original

120 - Carbonized (carbon accompanies form)

130 - Continuous roll

140 - Adhesive-backed

200 - Cardboard form

210 - Edge-Punched

300 - Bound pages

400 - Unbound pages

500 - Microform

510 - Microcard

520 - Microfilm

600 - Plastic

700 - Metal

The color of a form may be important in some libraries; for example, in some circulation systems the due date of a book is indicated by the color of the charge card. Column 28 can in such cases be used to code the color; i.e. 1-Buff, 2-Salmon, etc.

Secondary Function of Form - 1 column

Column 29

1 - Environmental
2 - Acquisition
3 - Organization
4 - Formalizing
5 - Matching

Point of Origin - 5 columns

Column 30 - Personnel

1 - Librarian
2 - Associate Librarian
3 - Assistant Librarian
4 - Department head
5 - Other professional
6 - Top clerical - e.g., head clerk, senior clerk
7 - Other clerical
8 - Student assistant, page, etc.
9 - External

Columns 31-32 - Internal department of library, departmental collection, branch, etc.

10 - Librarian's office

20 - Technical processes

21 - Acquisitions
22 - Cataloging
23 - Serials
24 - Serials catalog
29 - Sorting room

30 - Readers' Services

31 - Circulation desk
32 - Stacks
33 - Reference
34 - Interlibrary loan
35 - Xerox
36 - Card catalog
37 - Microfilm area
38 - Reserve
39 - Index-abstract area

40 - Departmental (other)

41 - Lehigh collection
42 - Rare book room
43 - Honeyman room
44 - Map collection
45 - NPIRI
46 - Chemistry
47 - Juvenile

50 - Miscellaneous

51 - Warehouse
52 - Exhibits

60 - Data Processing

99 - All departments

Columns 33-34 - External

10 - Borrower

11 - Faculty member (as borrower)
12 - Student
13 - Non-university

20 - Other university groups

21 - President's office
22 - Bursar
23 - Accounting office
24 - Faculty
25 - Computing laboratory

30 - Other libraries

31 - Library of Congress

40 - Vendors

41 - Stechert-Hafner
42 - Moore-Cottrell

50 - Donors of free material

60 - Job applicants

61 - Professional
62 - Non-professional
63 - Students

99 - Miscellaneous external

Point of Disposal - 4 columns

Columns 35-38 (Use same code as for columns 31-34)

Average Volume Per Month - 2 columns

Column 39 - use to indicate frequency of use and seasonal activity.

0 - Form is used constantly, or its peaks of activity are meaningless (use with 1-9 in column 40).

1 - Daily
2 - Weekly
3 - Semi-monthly
4 - Monthly
5 - Quarterly
6 - Yearly
7 - Beginning of semester, or trimester
8 - Beginning of academic year
9 - As requested, or whenever occasion arises (use with 0 in column 40).

Column 40 - Average volume per month

0 - Less than 1
1 - 1-10
2 - 11-99
3 - 100-499
4 - 500-999
5 - 1000-1999
6 - 2000-4999
7 - 5000-9999
8 - 10,000-49,000
9 - over 50,000

Appendix C: Punched Card Coding (Activity Card)

Agency - 3 columns

Columns 41-43 - Person performing activity. Use same code as for columns 30-32 (first three columns of point of origin field). If the person is a borrower or some other person not employed by the library, use 999.

Activity - 3 columns

Columns 44-46

Cycle A

100 - Originate - first writing performed on a form. Does not include mechanical reproduction of a form in its entirety. If the writing is original, use numbers 101-150 in this field. Use also writing reference field (columns 47-51) to show what is written. If the writing is the result of transcribing or copying from another form, or is produced as a carbon copy as another form is originated, use code numbers 151-199. Show what is written in the writing reference field. If information is copied from another form, show the number of that form in the form reference field (Columns 52-58).

Original writing
101 - By writing
102 - By typing
103 - By punching
104 - By teletype
105 - By automatic data collection system; e.g., IBM 357.

Transcribed writing
151 - By writing
152 - By typing
153 - By punching
154 - By teletype
155 - By automatic data collection system

200 - Post - add, correct, remove, or explain information on a form, by writing or other means. Use writing reference field (columns 47-51) to show what is written and form reference field (columns 52-58) to show the number of any form referred to.

Original
201 - By writing
202 - By typing
203 - By punching
204 - By stamping
205 - By erasing
206 - By addressograph

Transcribed
251 - By writing
252 - By typing
253 - By punching
254 - By stamping
255 - By erasing
256 - By addressograph

300 - Verify - inspection for accuracy and/or completeness. Use form reference field (columns 52-58) to record number of any form referred to.

301 - By hand and eye
302 - By direct conversation
303 - By telephone conversation
304 - By intercom conversation
305 - By consulting book
306 - By consulting file
307 - With adding machine

320 - Obtain information. Person acquires knowledge for use on a form. Not used where information is copied from another form.

321 - By direct conversation
322 - By observation
323 - By telephone conversation
324 - By intercom conversation
325 - By consulting book
326 - By consulting file

329 - By using another form - indicate form in form reference field.

340 - Supply information. Person supplies data for use on form.

341 - By conversation
342 - By observation
343 - By telephone conversation
344 - By intercom conversation
345 - By mental reference

349 - By using another form - indicate form number in form reference field.

399 - Exercise judgment - independent reasoning and decision-making. (This was the code used at Lehigh because not much is known at present about this area; however, as the decision-making process becomes more important, we recommend that codes 360-399 be allotted to this function.)

Cycle B

400 - Sort - arrange forms by classes and/or subclasses.

401 - By hand
402 - Automatically
403 - With needle

410 - File - arrange in some order. Use only for paper and/or cardboard forms.

411 - By call number
412 - By date
413 - By author
414 - By title
415 - By name (of borrower, vendor, etc.)
416 - By department
417 - By number

419 - Alphabetically for filing in catalog (author, title and/or subject in one alphabet)

420 - Arrange books in order

421 - By call number

423 - By author
424 - By title
425 - By name (e.g., of borrower)

430 - Interfile - merge one file with another

431 - By call number
432 - By date
433 - By author
434 - By title
435 - By name
436 - By department

440 - Shelve books in order

441 - By call number

443 - By author
444 - By title
445 - By name

450 - Search file - locate presence or absence of a form, or information on a form.

451 - Public catalog
452 - Shelf list
453 - Serials file
454 - Departmental files
455 - Departmental charge file
456 - Standing order file

461 - Interlibrary loan file

471 - Circulation file
472 - Borrowers' registration file
473 - Periodicals file

475 - Reserve book file
476 - Billed file

480 - Count

490 - Search shelves - locate presence or absence of graphic material.

500 - Attach to another form. Use form reference field to show form number.

501 - Temporarily
502 - Permanently (e.g., book label)

550 - Separate from another form - indicate form number in form reference field.

600 - Calculate

601 - Mentally
602 - By adding machine

650 - Reproduce - duplicate complete form into one or more exact copies - after origination.

651 - By writing
652 - By typing
653 - By punching
654 - By stamping
655 - By Xerox
656 - By microfilming
657 - By mimeographing
658 - By multilithing

Cycle C

700 - Put on shelf in no order

730 - Insert in file or envelope

731 - Insert in file by hand - when not interfiling
732 - Insert in envelope
733 - Insert in case, box, etc. (e.g., pack)

760 - Remove from file or envelope

761 - Remove from file (usually follows file search)
762 - Remove from envelope or package
763 - Remove from case, box, etc.
764 - Remove from stacks or shelf

799 - Destroy - all cases

800 - Move - not for movements within a department

- 801 - By carrying
- 802 - By office mail
- 803 - By campus mail
- 804 - By U.S. mail
- 805 - By pneumatic tube
- 806 - By dumbwaiter

900 - Delay - temporary delay of form, or a group of the same and/or different forms, pending another activity. Code shows reason for delay.

- 901 - For accumulation
- 902 - For approval
- 903 - For activity on another form
- 904 - For workload
- 905 - For movement
- 906 - For information

- 909 - For time to pass (arbitrary time period)

999 - Unanalyzed activity - used when form is handled outside of library.

Writing Reference - 5 columns

Column 47 - use to show consecutive order of writings occurring in one operation. Not used if one entry in columns 48-50 shows all writing done.

Columns 48-50 - use to code what is written.

Column 51 - weighting factor for columns 48-50. The actual writing of information requires time, which varies with what is written. The times listed with each type of information are suggested as a guide to this weighting.

What is written	Weight
100 - Personal information	
101 - Initials	1
102 - Name	1
103 - Name and address	2
104 - Address	1
105 - Name and department	2
200 - Bibliographic information	
201 - Call number	1
202 - Author	1
203 - Title	1
204 - Call number and author	2
205 - Call number and title	2
206 - Author and title	2

207 - Call number, author and title 3
208 - Complete bibliographic information, including publisher, date of publication, price 6
209 - Periodical index reference 4
210 - Abstract 7
211 - Collation 1
212 - LC number 1
213 - Cutter number 1
214 - Publisher, place, date of publication 3
215 - List of books 8
216 - Accession number 1

300 - Information peculiar to Lehigh

301 - Name of university 1
302 - Rare book 1
303 - Lehigh collection 1
304 - Honeyman 1

400 - Statistical information

401 - Tally mark 1
402 - Number filled in 1
403 - Complete statistical report 8

500 - Financial information

501 - Hours worked 1
502 - Dollar amount 1
503 - Complete financial report 8
504 - Order or billing information 6

600 - Miscellaneous information

601 - Date 1
602 - Vendor or binder name, or other name 1
603 - One miscellaneous word, such as Bkl., or a miscellaneous number 1
604 - One sentence or short paragraph of original information 6
605 - One page original information 7
606 - Several pages original information 9
607 - Code letter 1
608 - Vendor name and address 2
609 - Date and "Lehigh" on same stamp 1

Form or Move Reference - 7 columns

Columns 52-58 - when this field is used as form reference, use seven-digit form number whenever another form is involved in activity. When this field is used as move reference, indicate distance moved in columns 52-53 and the place to which it is moved in columns 54-57 (see columns 31-34 for code). The investigation of distances moved may not be particularly rewarding. Judgment in an individual library may prove that it is, however, and the following codes are suggested.

Column 52 Code No.	Units	Code No.	Column 53 Min.	Max.	Ave.
0	ft.	0	0	0.9	0.5
1	yds.	1	1.0	1.9	1.5
2	miles	2	2.0	3.9	3.0
		3	4.0	7.9	6.0
		4	8.0	15.9	12.0
		5	16.0	31.9	24.0
		6	32.0	63.9	48.0
		7	64.0	127.9	96.0
		8	128.0	250.0	190.0

Frequency - 2 columns

Columns 59-60 - this field may contain the same information as do columns 39 and 40 (average use per month), or it may contain information learned from a work study.

Time Required - 4 columns

Columns 61-64 - number of seconds and tenths of seconds to process each individual form, or number of hours and tenths of hours to process all forms used in a month.

Columns 65-67 - not used

Order of Occurrence - Internal - 10 columns

Columns 68-69 - consecutive numbering of activities performed

Columns 70-71 - reasons for variations in procedure

01 - 29 - Variations in form or use of graphic material
- 01 - Monograph
- 02 - Reference book
- 03 - Reserve book
- 04 - Paperback book
- 05 - Rare book
- 06 - Juvenile book
- 07 - Lehigh collection
- 08 - Lehigh dissertation
- 09 - Continuation
- 10 - Periodical
- 11 - Non-periodical serial
- 12 - Newspaper
- 13 - Microfilm
- 14 - Microcard
- 15 - Microcard other than UN document

30 - 49 - Variations in method of acquisition of materials
- 30 - Not ordered from standing order vendor
- 31 - Supply item (or supply and equipment)
- 32 - Equipment item
- 33 - Ordered from Supply Bureau
- 34 - Gift

35 - Out-of-print book
36 - Item rejected
37 - No stamp for vendor name

50 - 69 - Differences in methods of processing materials
50 - New serial
51 - No LC number on order slip
52 - LC cards not arrived
53 - Book has arrived from vendor
54 - Book has not arrived from vendor
55 - Temporary cataloging done at time of search
56 - Book is reordered
57 - Book is not reordered
58 - Material not what was ordered
59 - Book needs new call number
60 - Book cataloged by commercial agency

70 - 79 - Variations in circulation procedures
70 - Borrower is student
71 - Borrower is from another institution
72 - Book is marked notify
73 - Book has been recalled
74 - Renewal requested
75 - Cash transaction

80 - 99 - Miscellaneous variations or variations in several procedures
80 - Book is on shelf
81 - Book is not on shelf
82 - Card is in file
83 - Card is not in file
84 - Unbound materials have no book cards
85 - Material not to be bound
86 - Incorrect typing or keypunching
87 - Form to be mailed

99 - Completely miscellaneous and random

Columns 72-73 - consecutive numbering of steps in alternate routine

Columns 74-75 - reasons for variations in alternate procedure. See under columns 70-71 for coding.

Columns 76-77 - consecutive numbering of steps in variation of alternate routine.

Order of Occurrence - External - 3 columns

Columns 78-80 - Numbers in this field are comparable to the line numbers of a flow chart. They enable the analyst to relate internal order of occurrence numbers, which will vary on different forms, to each other. Ideally, an external number would be assigned to each card. However, since this would require drawing

a flow chart of the entire library and its operations, external order of occurrence numbers are used only when necessary; i.e., when two forms come together, separate, or are handled simultaneously, as in sorting or interfiling. It may be helpful here to select a key form, assign to it a number in the vicinity of 500, and work forward and backward from this. Suggested numbers for various library processes are given below.

100-199 - administrative, personnel
200-299 - order and receiving
300-399 - cataloging and binding
400-599 - circulation
600-699 - Xerox, billing, reserves
700-799 - interlibrary loan
900-999 - statistics

Appendix D: Punched Card Coding (Users)

User Characteristics - 4 columns

Column 1 - Institution

1 - Lehigh
2 - Other institution of higher learning
3 - High school
4 - Industry
5 - Other

Column 2 - Academic status (if from academic institution)

1 - Faculty or staff
2 - Graduate student
3 - Senior
4 - Junior
5 - Sophomore
6 - Freshman
7 - Unspecified undergraduate (if person not affiliated with Lehigh)
9 - Other

Columns 3-4 - College or department (if Lehigh personnel)

01 - College of Arts and Science
02 - College of Business Administration
03 - College of Engineering
04 - Department of Education
05 - Administrative staff
06 - Special curricula

Purpose of User - 14 columns

Columns 5-8, 9-12 - Informational questions

Columns 5, 9 - Use to classify type of information

1 - Specific fact
2 - Specific book (s)
3 - Specific journal article(s)
4 - Material on specific subject
5 - Current awareness of specific subject
6 - Bibliographic material

Columns 6-8, 10-12 - Divide by subject using the first 3 digits of the Dewey decimal classification

Columns 13-15, 16-18 - Other activities

100 - Browsing

200 - Pleasure reading

300 - Receiving instructions

310 - General location of materials in library
320 - Use of card catalog
330 - Use of serials catalog
340 - Use of microfilm reader
350 - Use of microcard reader
360 - Use of indexes, abstracts, etc.

400 - Requests for action

410 - Order
411 - Request for purchase of book, etc.
412 - Request for information on requested purchase
420 - Circulation
421 - Request for reserve book
422 - Request to put book on reserve
423 - Request for personal reserve
424 - Request for locate
425 - Request for renewal
426 - Return book (s)
430 - Xerox
440 - Inter-library loan
441 - Request to borrow book
442 - Request for information on status of book requested
443 - Request for renewal
444 - Return book

500 - Questions on library procedures

510 - Library hours
520 - Gift policy
530 - Book borrowing and use of library

600 - Directional questions

800 - Studying

900 - Other

Sources Used - 20 columns

Columns 19-20, 21-22, 23-24, 25-26, 27-28 - Catalogs, Indexes, etc.

01 - Card catalog, author
02 - Card catalog, subject
03 - Serials catalog
04 - Indexes
05 - Abstracts
06 - Bibliographies
07 - Serials catalog
08 - Other

Columns 29-30, 31-32, 33-34, 35-36, 37-38 - Printed materials, etc.

01 - Dictionaries
02 - Encyclopedias
03 - Handbooks
04 - Pamphlets
05 - Other reference materials
06 - Reserve books
07 - Stack books
08 - Paperback books
09 - Newspapers
10 - Bound periodicals
11 - Unbound periodicals
12 - Maps
13 - Microfilm/cards
14 - Rare books
15 - Lehigh collection
16 - Other

Areas of the Library Visited - 14 columns

Columns 39-40, 41-42, 43-44, 45-46 - Where possible, use same code as in columns 31-32 of Form Card (Point of Origin - Internal Department). See Appendix B. Codes used at Lehigh are listed below. The three numbers beginning with "8" are for areas not coded in the descriptions of the forms and their activities.

10 - Librarian's office
21 - Order department
22 - Catalog department
23 - Serials department
24 - Serials catalog
30 - Readers' services office
31 - Circulation desk and office
33 - Reference desk
35 - Xerox
36 - Card catalog
37 - Microfilm area
39 - Index/abstract area
41 - Lehigh room
42 - Rare book room
81 - Reading room
82 - Reference collection
83 - Periodicals section
90 - Other

Columns 47-49, 50-52 - Use if the area visited is the stacks, coding with the first three digits of the Dewey decimal number.

Library Forms Signed or Filled Out - 14 columns

Columns 53-59, 60-66 - Use seven-digit form number (columns 1-7) of Form Card. See Appendix B.

Time Spent on Search - 1 column

Column 67

1 - Less than 15 minutes
2 - 15-30 minutes
3 - 30-60 minutes
4 - More than 60 minutes

Change in Goal - 1 column

Column 68

0 - No
1 - Yes

Reason for Change in Goal - 1 column

Column 69

1 - Found unexpected information
2 - Unable to find answer to original question
3 - Error in formulation or conception of original question
4 - Circumstances beyond user's control (i.e., forced to kill time because of absence of personnel, etc.)
5 - Decided another objective more worthwhile

Personnel Consulted - 9 columns

Columns 70-72, 73-75, 76-78 - For library personnel, use same coding as in columns 30-32 (Point of Origin - Internal) of Form Card. (Appendix B) For non-library personnel, use:

911 - Faculty
912 - Student
919 - Other

Linear Measure of Success - 1 column

Column 79

1 - Eureka! Exactly what I want!
2 - Looks good, but I'll have to do more digging in the material I found
3 - Not too sure - it looks as though the material only partially answers my question
4 - Can't find anything on what I want

Reasons for Lack of Success - 1 column

Column 80

1 - Material not owned by library
2 - Material unavailable (i.e., in circulation, not on shelf)
3 - Too much material

4 - Not enough material
5 - Unable tc find library staff
6 - Unable to describe need to library staff
9 - Other

Appendix E: Interview Form

Date_____

Time_____

Lehigh University — Library Use Study

Interview

We are conducting a survey to see how successful libraries are in meeting the needs of users. May I ask you a few questions which will take about ten minutes to answer?

1. What, in general, was the purpose of this trip to the library? [There may be more than one reason. If answer has nothing to do with using the library as a library (for example, going to class, looking at girls) or with seeing library personnel, terminate interview. If person says he came to study, ask whether he used library materials or his own.]

If answer to question 1 is unconnected with seeking information (e.g. came to talk with Librarian, get something Xeroxed, etc.), ask only questions 2, 5, 6 and 10. If interviewee has used library simply as a place to study, and has used no library materials and talked to no library personnel, fill in Study Tally Sheet.

2. What is your affiliation with Lehigh?

____ a member of faculty or staff _____ Department.

____ a graduate student _____ Department.

____ a Lehigh undergraduate ____ Year _____ Major.

____ attending a Special Summer Institute (Mathematics, Preview, Reading Clinic, etc.).

If not affiliated with Lehigh, are you

____ from another educational institution

Name of institution _____.

If student, check ____

____ from industry

Name of company _____.

____ other (describe) _____

_____.

3. Could you now be more specific as to the nature of the information you were seeking? Perhaps you could tell me the topic title, or the titles of any specific books, journal articles that you were looking for.

4. In what sources did you search for leads or for material? (Give Interview Sheet No. 1 to user. If unable to categorize source, write its name).

5. In what areas of the Library did you spend time? (Use Interview Sheet No. 2).

6. Did you fill out or sign any library forms during your visit? (Use Interview Sheet No. 2).

7. How much time did you spend on your search? (Until you found what you wanted or decided it was not available).

____ Less than 15 minutes,

____ 15 - 30 minutes,

____ 30 - 60 minutes,

____ More than 60 minutes.

8. While you were in the Library did your objective change? ____ Yes ____ No. If yes, how?

Did you accomplish any purposes other than your original one? ____ Yes ____ No. If yes, what?

9. If answer to the first part of question 8 is yes, what was the reason? (E.g., found unexpected information, unable to find answer to original question, realized question as originally formulated wasn't really what you wanted to know).

10. Did you seek information from or discuss the purpose of your visit with anyone in the Library?

____ Library staff member ____ Fellow student

____ Faculty member ____ Other

If library staff member, who?

11. Can you measure the success of this trip on a linear scale (1-4)? (Give sheet with scale - Interview Sheet No. 3 - to user).

12. If number 3 or number 4 was checked in question 12, what do you think is the reason? (Interview Sheet No. 3).

Thank you, your participation will help libraries in eventual improvement of service to users.

INTERVIEW SHEET NO. 1

Question 4. In what sources did you search for leads or for material? If you are unable to decide which of these categories best fit the sources, write the names of the sources in the space provided.

Catalogs, indexes, etc.

____ Card catalog, author (01)

____ Card catalog, subject (02)

____ Serials Catalog (03)

____ Indexes (04)

____ Abstracts (05)

____ Bibliographies (06)

____ Other (08) _____

_____

Names of Sources _____

_____

_____

_____

_____

_____

_____

_____

Printed materials, etc.

Materials from Reference Collection

____ Dictionaries (01)

____ Encyclopedias (02)

____ Handbooks (03)

____ Pamphlets (04)

____ Other Reference Materials (05)

Other Materials

____ Reserve books (06)

____ Stack books (07)

____ Paperback books (08)

____ Newspapers (09)

____ Bound periodicals (10)

____ Unbound periodicals (11)

____ Maps (12)

____ Microfilm/cards (13)

____ Rare books (14)

____ Lehigh collection (15)

____ Other (16) _____

_____

INTERVIEW SHEET NO. 2

Question 5. In what areas of the Library did you spend time?

____ Reading room (81)
____ Circulation desk & office (31)
____ Card catalog (36)
____ Reference desk (33)
____ Reference collection (82)
____ Index/abstract area (39)
____ Serials catalog (24)
____ Periodicals section (83)
____ Microfilm area (37)
____ Xerox (35)
____ Stacks
____ Section
____ Lehigh room (41)
____ Rare book room (42)
____ Librarian's office (10)
____ Order department (21)
____ Catalog department (22)
____ Serials department (23)
____ Readers' Services office (30)
____ Other (describe) (90) _____

_____

Question 6. Did you fill out or sign any library forms during your visit?

____ Book card (5211430)
____ Periodical charge card (5211450)
____ Reserve book card (5231610)
____ Reference book charge card (5221550)
____ Borrower's card (5211470)
____ Request for personal reserve (5241640)
____ Search request (4201110)
____ Storage request (4201120)
____ Xerox slip (2410671)
____ Interlibrary loan request (4301130)
____ Order request (2110260)
____ Other (describe) _____

_____

INTERVIEW SHEET NO. 3

Question 11. Could you measure the success of this trip on a linear scale (1-4)?

1. _____ Eureka! Exactly what I want! (1)
2. _____ Looks good, but I'll have to do more digging in the material I found. (2)
3. _____ Not too sure - it looks as though the material only partially answers my question. (3)
4. _____ Can't find anything on what I want. (4)

Question 12. If number 3 or number 4 was checked in question 12, what do you think is the reason?

_____ Material not owned by Library. (1)

_____ Material unavailable; e.g., not on shelf, etc. (2)

_____ Too much material. (3)

_____ Not enough material. (4)

_____ Unable to find Library staff. (5)

_____ Unable to describe need to Library staff. (6)

_____ Other (9) _____

_____

_____